

2 July 2020



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ULA5202_Rev3

Dear Robyn

SUBSIDENCE ASSESSMENT FOR FIRST WORKINGS AMENDMENT: ULAN WEST LONGWALL 8 MID-BLOCK ROADWAYS

As requested, please find herein our subsidence assessment to support first workings amendments for three groups of roadways:

1. proposed roadways required for longwall recovery and to ensure compliance with Clause 96 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (Clause 96)
2. various roadways adjacent to Longwall 8 maingate:
 - a. a roadway for longwall recovery to ensure compliance with Clause 96
 - b. a roadway required for infrastructure installation
 - c. an extension of the companion roadway to the Longwall 8B installation road to connect with the approved gateroad driveage.
3. various roadways adjacent to Longwall 7 maingate:
 - a. a slight move in the installation road for Longwall 8B to align with the BBKA
 - b. various cut throughs and stubs required for longwall recovery.

These roadways are required for longwall recovery, infrastructure improvements and longwall face installation to allow Longwall 8 to step around the barrier designed to protect specific surface features within the Broken Back Conservation Area (BBKA).

Our assessment indicates that the proposed first workings do not have potential to cause any surface subsidence effects (movements) of practical significance or any impacts to the surface or surface features. Significant heritage and other subsidence performance items within the Brokenback Conservation Area would not be impacted and would remain fully protected from subsidence related impacts consistent with Subsidence Performance Measures - Condition 24, Schedule 3 of Project Approval 08_0184 (MOD4).

1. REASON FOR FIRST WORKINGS AMENDMENT

Figure 1 shows the location of the proposed first workings. There are three groups of workings, all located within a barrier to longwall mining that is required to protect cliff formations and significant heritage sites within the BBCA.

The first group of first workings are intended to assist with ventilation and access during recovery of the longwall supports when the longwall steps around the BBCA. Specifically, these proposed recovery headings are required to:

- provide a second ventilation path and access way for equipment recovery when the longwall face is stepped around the BBCA; and
- provide a second means of egress to persons and ensure compliance with Clause 96.

The Regulation prohibits the formation of a roadway greater than 250m in length without a second means of egress. The longwall face is 400m in length. When the longwall roof supports are recovered to step around the BBCA, UW will require the proposed first workings to be able to satisfy Clause 96 of the Regulation.

The second group of first workings is located in and adjacent to the maingate of Longwall 8. These workings are required to ensure compliance with Clause 96, allow installation of mine infrastructure and extend the companion road to the Longwall 8B installation road.

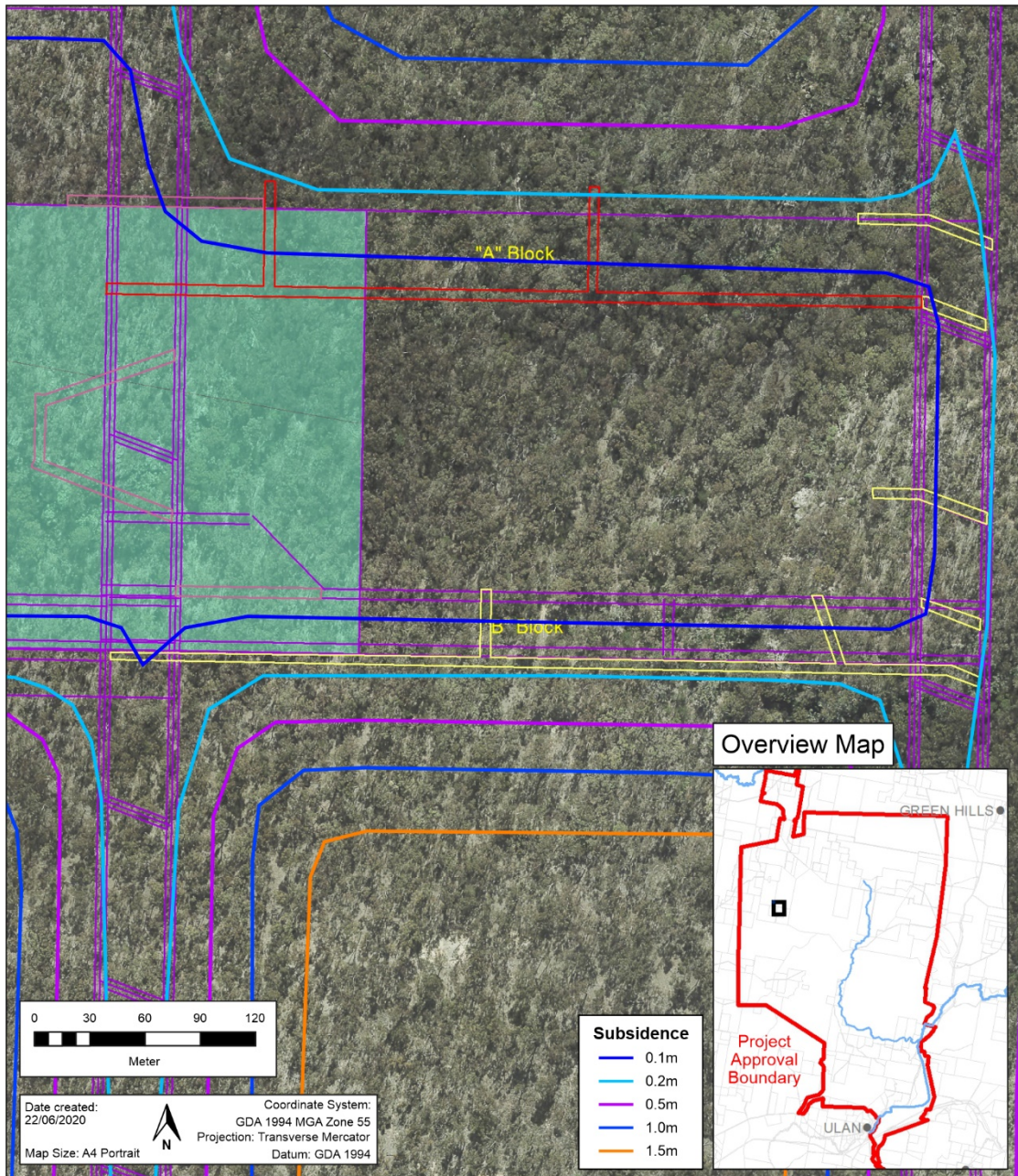
The third group of first workings is mainly in the maingate of Longwall 7 and includes a slight move in the installation road for Longwall 8B so that the goaf of Longwall 8B remains outside the BBCA and various cut-throughs and stubs required for relocation of the longwall face.

The proposed amendments to underground workings do not involve the addition or change in the approved location of any previously approved surface infrastructure.

2. SUBSIDENCE ASSESSMENT

None of the proposed first workings, of themselves, have potential to cause surface subsidence or impact surface features.

When Longwall 8A, the northern section of Longwall 8, is mined, the pillar that is formed between Longwall 8A and the recovery heading would be approximately 40m wide (measured rib to rib). For a 3.2m mining height, the width to height ratio of this pillar would be 12.5. At a depth of 170m, there would be no potential for a pillar of this width to height ratio to become unstable and cause additional surface subsidence. The subsidence profile ahead of the longwall panel would not be significantly affected by the presence of the recovery roadway or the recovery chutes driven off this roadway.



- First Workings Group 1
- First Workings Group 2
- First Workings Group 3
- Approved Ulan West Mine Plan
- Biodiversity Heritage Offset Areas**
- Brokenback Conservation Area

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Figure 1: Proposed first workings amendments.

The second group of first workings are located within or immediately adjacent to the barrier required to protect the BBCA. There is no potential for these roadways to cause surface subsidence.

The third group of first workings does not have potential to cause surface subsidence. When Longwall 8B is extracted, a 30m wide pillar is formed adjacent to the goaf. The nominal width to height ratio of this pillar is 9.3 making it large enough to continue to gain load-bearing capacity if it were to become overloaded. However, the pillar remains loaded to less than its nominal strength under end abutment loading from the longwall. This pillar is long-term stable and there is no potential for additional subsidence associated with pillar instability.

None of the proposed first workings amendments have potential to cause subsidence or to significantly affect the subsidence effects or subsidence impacts that are approved to occur at the completion of mining Longwall 8.

If you have any queries or require further clarification of any of the issues raised, please don't hesitate to contact me directly.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Ken Mills', with a large, stylized flourish above the name.

Ken Mills
Principal Geotechnical Engineer